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A Computer Program for Counting Load Spectrum Cycles

based on the

Range Pair Cycle Counting Method

V. A. Tischler

Technical Memorandum FBR 72-4

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### FOREWORD

This report was prepared by V.A. Tischler of the Solid Mechanics Branch, Structures Division, Air Force Flight Dynamics Laboratory. The work was conducted in-house under Project 1467, "Structural Analysis Methods," Task 146702, "Analysis Methods for Damaged Structures". Mr. Howard A. Wood is the Project Engineer.

The manuscript was released by the author in November 1972.

This technical memorandum has been reviewed and is approved.

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Structures Division

## ABSTRACT

This report presents a detailed description of a computer program based on the Range Pair Cycle Counting Method, as given in Reference 3. The Range Pair Cycle Counting Method is a procedure for generating an analysis spectrum from a given load spectrum. Examples are presented where the resulting analysis spectrum will be used as input to a crack growth analysis program.

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### SECTION I

### INTRODUCTION

In crack propagation analysis it is necessary to have a correct representation of the load spectrum. A load spectrum obtained from tests may not be directly applicable to analysis. The Range Pair Cycle Counting Method is a means of determining an accurate analysis spectrum from the actual load spectrum. This method is briefly discussed and compared with other counting methods in References 1 and 2. A more comprehensive discussion which forms the basis for the development of the present computer program is given in Reference 3.

The computer program treats a load spectrum S as a collection of n peaks and valleys designated by  $x_i$ ,  $i=1,\ldots,2n$ , such that if  $x_i$  is a peak then  $x_{j+1}$  is a valley,  $1 \le j \le 2n-1$ . The analysis spectrum is represented by a collection of m cycles  $\{(a,b)_i\}, i=1,\ldots,m$ , such that  $a_i$  and  $b_i$  are elements of S. The Range Pair Cycle Counting Method considers four points  $(x_1,x_2,x_3,x_4)$  at a time and the conditions for counting a cycle  $(x_2,x_3)$  are as follows:

If  $x_2 > x_1$ , then a cycle is counted if

 $x_2 \le x_4$  and  $x_3 \ge x_1$ .

Conversely, if  $x_2 < x_1$ , then a cycle is counted if

 $x_2 \ge x_4$  and  $x_3 \le x_1$ .

This method is illustrated in Figure 1.

Thus, starting at the beginning of the load spectrum the first four points  $x_1$ ,  $x_2$ ,  $x_3$  and  $x_4$  are considered. If  $x_2$  and  $x_3$  meet the above conditions, a cycle is defined and these two points are deleted from the spectrum. Consequently  $x_4$  becomes  $x_2$  and the next two points of the spectrum are added to again give four points. Counting continues until the four points considered do not define a cycle. Then  $x_1$  is omitted from consideration and becomes an element of a residue spectrum. The three remaining points are updated, i.e.  $x_2$  becomes  $x_1$ ,  $x_3$  becomes  $x_2$ ,  $x_4$  becomes  $x_3$ , and  $x_4$  is added sequentially from the load spectrum. This process continues until there are only two or three points remaining. These points are added to the residue spectrum, which is then analyzed in the same manner as the original load spectrum. Continuing in this manner a residue spectrum is

finally generated which will yield no cycles by the Range Pair Cycle Counting Method. This residue spectrum diverges to a maximum range and then converges as shown in Figure 2. Cycles are generated from the final residue spectrum as follows: Pair the highest peak with the lowest valley to form a cycle. Then moving away from this cycle in both directions, each successive peak and valley are paired together. If there is an extra peak or valley left on either side, it is omitted. This counting method is illustrated in Figure 2.

In summary, an original load spectrum is analyzed using the Range Pair Cycle Counting Method to produce an analysis spectrum plus a final residue spectrum. This final residue spectrum is then analyzed by a pairing technique to determine the remaining cycles, which are then added to those previously counted. The result is a complete analysis spectrum for use in analytical predictions.

### SECTION II

## PROGRAM ORGANIZATION

The Range Pair Cycle Counting program, RPCM, assumes that the input load spectrum, S, is defined by n peaks and valleys,  $(x_1,y_1)$ , and n counters  $k_1$ ,  $i=1,\ldots,n$ , where  $k_i$  is a count of the number of times the ith peak and valley are to be repeated sequentially. The program then assigns a step number  $j, j=1,\ldots,n$  to each peak and valley of S. Since the analysis spectrum is generated in disjoint parts, i.e. from the input load spectrum, from each residue spectrum, and from the final residue spectrum, the step numbers are used to sort the analysis spectrum relative to the sequencing of the initial load spectrum. Sequence becomes important particularly in crack growth analysis. When the counter k is less than 1, as can occur in a flight by flight load spectrum, the peak and valley associated with k is not analyzed by the program, but is transferred directly into the analysis spectrum and subsequently sequenced relative to its step number.

The program RPCM is divided into three parts. Each part is described below in a step-by-step manner.

### Part I

- 1. The initial load spectrum S is adjusted by removing those peaks and valleys whose counter k is less than one.
- 2. The initial load spectrum S is further adjusted if for some i, the ith peak and valley are equal to the (i+1)th peak and valley, by maximizing the counter  $k_i$ .
- 3. The Range Pair Cycle Counting Method is now applied to the adjusted load spectrum, S. Program RPCM calls Subroutine DECIDE with four elements from S. Subroutine DECIDE determines whether a cycle is to be generated or whether  $\mathbf{x}_1$  goes to the residue spectrum. Cycles are generated in Subroutine CYCGEN.

## Part II

1. The Range Pair Cycle Counting Method is applied to the residue spectrum. Program RPCM calls Subroutine DECRES with four elements from the residue spectrum. Subroutine DECRES determines whether a cycle is to be generated or whether x<sub>1</sub> goes to the next residue spectrum. Cycles are generated in Subroutine CYCRES.

2. If the current residue spectrum has less than three points or if no additional cycles can be generated by the Range Pair Cycle Counting Method, proceed to Part III, otherwise return to Step 1.

# Part III

- 1. The remaining cycles are generated from the final residue spectrum.
- 2. The analysis spectrum is sorted relative to the sequencing of the input load spectrum.

# SECTION III

# INPUT INSTRUCTIONS

Card No. (Format)	Variable Name	<u>Definition</u>
1 (8A10)	TITLE	An alphanumeric description of the load spectrum, S
2 (2I5)	NPKS	Number of peaks or valleys in the load spectrum, S
	NPUNCH	Punch flag NPUNCH # 0 implies the analysis spectrum will be punched in the input format.
3,,NPKS+2 (5x,3E10.3)	SIGMAX(I)	Ith peak of the load spectrum, S
	SIGMIN(I)	Ith valley of the load spectrum, S
	RNCYC(I)	counter $k_i$ of the Ith peak and valley

### SECTION IV

## TABULAR OUTPUT

## Program RPCM gives the following output:

- 1. The input load spectrum, S.
- 2. The adjusted load spectrum as discussed in Section II.
- 3. The elements and step numbers of Residue Spectrum 1.
- . 4. The elements, the step number and the counter k of the cycles generated from the adjusted load spectrum.
- 5. The elements and step numbers of Residue Spectrum 2.
- 6. Step 4 output is repeated plus any additional cycle information generated from Residue Spectrum 1.
- 7. Steps 5 and 6 are repeated for each residue spectrum until the final residue spectrum is generated.
- 8. All previous cycle output plus any additional cycle information generated from the final residue spectrum.
- 9. The Range Pair Cycle Counted spectrum, i.e., the analysis spectrum.

### REFERENCES

- 1. J.B. de Jonge, "The Monitoring of Fatigue Loads," National Aerospace Laboratory NLR, The Netherlands, Report MP 70010 U.
- 2. N.E. Dowling, "Fatigue Failure Predictions for Complicated Stress Strain Histories", University of Illinois, Urbana, T.&A.M., Report No. 337, January 1971.
- 3. S. Streitmatter, "A Method of Counting Spectrum Load Cycles", North American Rockwell, Los Angeles Division, TFD-72-358, March 1972.

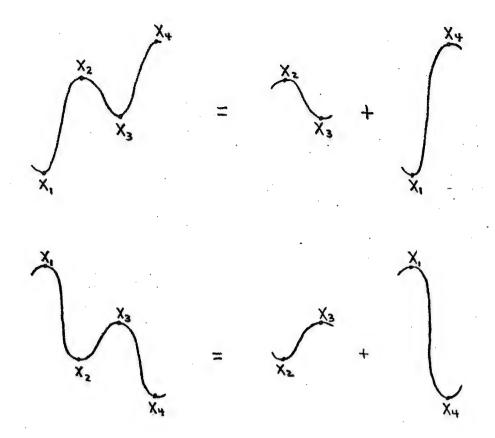


Figure 1

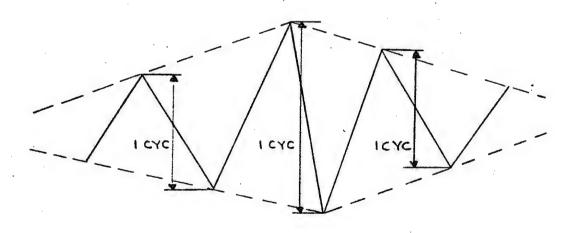
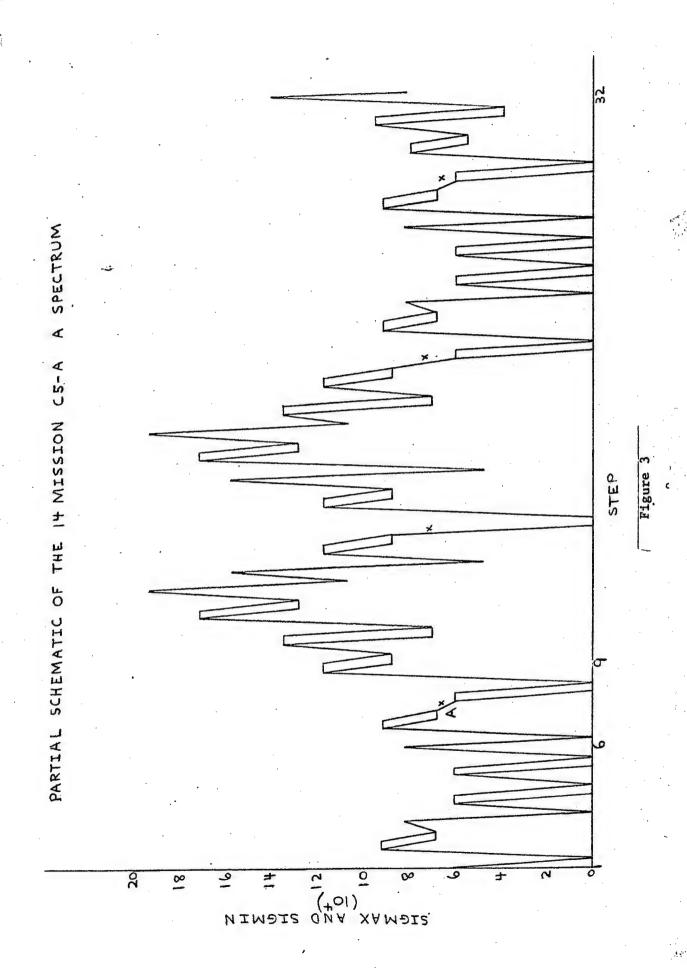
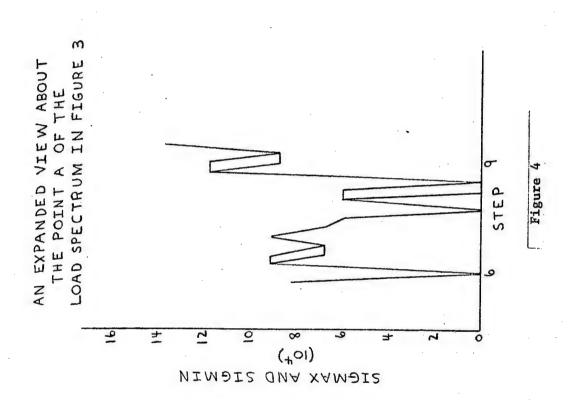


Figure 2







APPENDIX 1

SAMPLE PROBLEMS

# 1. 14 Mission C5-A A Spectrum

A partial plot of the input load spectrum S is given in Figure 3. The full spectrum is listed on P . It has been observed that the spectrum listing may not be a good representation of the load spectrum since some of the peaks or valley values given in the spectrum listing do not match the actual peaks and valleys on the load spectrum. This can be illustrated by steps 6 through 9 of the spectrum listing.

6	8215.0	0.0	1
7	9146.0	6846.0	5
8	6065.0	0.0	12
9	11790.0	8790.0	50

The load spectrum that these 4 steps would produce is given in Figure 4. Now considering the actual peaks and valleys shown in Figure 4, steps 6 through 9 should become

8215.0	0.0	1
9146.0	6846.0	4
9146.0	0.0	1
6065.0	0.0	11
11790.0	8790.0	50

These five steps may now be range pair counted according to the rules given. The x's on Figure 3 indicate additional places where the above type of behaviour occurs.

The program as written can handle such discrepancies in the initial load spectrum.

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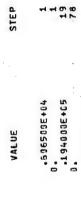
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SIGHA	MAXIMUM	36590E	14688E+3	1 0	1500E+0	14600E+1	06530	1790CE+3	35400E+3	72330E+3	57900E+3	17900E+0	57900E+3	72000E+3	35400E+3	35400E+1	1/900E+3	16500E+3	146966	11200012	1500541	1460CE+1	065505+3	947005+3	30E+3	22500	13976E+3	947065+3	0650CE+3	1650CE	14600E+3	21500E+J	06500E+J	21500E+0	1 1	64306690	39705	22500E+1	4970GE+3	00E+1	94750E+1	C6500E+3	06500E+0	4630543	7 2	21 500 641	14688E+1	0650JE+9	17940E+3	354JCE+0	72330E+3	57900E+	7900E+3
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.764000E+04
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                                   .6845UCE+04
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.172600E+05
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VALUE	.606500E+C4 0. .194000E+C5

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SIGMA	,606500E+14	14600E+1	.821500E+J4	2 7	530E+3	500E+0	.117930E+15	5430E+3	U+30002	143006	7900E+3	.172030E+35			0	<b>~</b> ·	\$1+0000 * 00 * 00 * 00 * 00 * 00 * 00 * 0	1 1	24 500 F + 1	146005+1	16500E+1	.794768E+34	Ŧ	7	+ +	#F+300/#6/*		7	$\Xi$	7	Ŧ	7	*606500E+94	7	7	+3	19700	-	.606500E+34	• 606530E+34	• 914500E+34	*821500E+34	45+300000°	4146005120	4C+300247	.117900E+35	1354006+15	.172000E+35	.157900E+05	7900E+
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	5500E+0	44700E+0	1.0000
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.135420E+35
.107336E+35
.115400E+36
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.60550E+34
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RANGE PAIR CYCLE COUNTED SPECTRUM

			The state of the s				٠												The second control of			,																											
COUNTER K	12.00000	4.00000	1.00000	**	• 30	. 00 00	000	rt •		0.0.0	4.3000	1.00000	1.00	880000		<b>3</b> C	1.0000	900	28.00000	000	÷.	•	*******	1.00000	24.00000	1.00000	4.00000	1.00000	56-00-00	24.00000	1.00600	23.00000	1.00000		1.00	1.00000	11.00000	000000	1.00000		1.00	- 000000*	1.00	1.000	0	3 4	3 0		5
SIGHA	•	. 684500E+04	.0	• 684600E+34	•		404510489.	• G	87930CF+1	• 764336E+34	. 129000E+05	.0	.1C703CE+05	# 00 00 00 00 00 00 00 00 00 00 00 00 00	4040000044 ·	#14200001+	0.	.1C733CE+35	*764939E+94	. 8793GEE+34	, 704800E+34	2 0 4 1 9 C 3 9 B 3 C	0.		•0		• 6846 385+34	• (		. 3897 00E+34	•0	. 58503(5+34	• 8104JGE+J4	. 544700E+34	. 199703E+34			• 6846005+34	- F84510F+04			+ 684600E+04	•	•	\$0+H00/556.	40+1100-1540 ·	10-330700-	.81030FF+3	*38970GE+04
SI	.60650CE+34	.914600E+14	.914666E+34	. 821500E+14	• 606500E+14	- 021500E+84	\$6+3000+46 ·	#F+3556##F*	.117900E+35	.135400E+35	.1723035+35	.194000E+15	447055135	447000540	1579466415	1720005+35	.19400E+05	.13540GE+15	.135400E+35	.117906E+35	.117900E+JS	46400000	.914600E+04	. 82150CE+34	. 566530E+14	. 821500E+34	0466066416	• 616505F+14	.794700E+34	*649700E+14	40000E+0	.122500E+15	.122500E+15	.79470GE+14	.794700E+14	. 6055005+34	• 606530E+34	. 9145000E+14	.8215005+04	*605500E+34	w	.91460UE+04	• 91463CE+34	* 506 500E+14	1130705136	1225306+15	ı w	\$649700E+34	1
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2. 5.0g Flight by Flight Spectrum

5.16 FLIGHT BY FLIGHT SPECTRUM
THE NUMBER OF PEAKS OR VALLEYS IN THE INPUT LOAD SPECTRUM =

o distriction	COUNTRY	000 T	0 0 0	(.)	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	0		1.3	000	133	200	16.000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		11 11 11 11 11 11 11	1,0000	3 6	1 "	000				1000	10000000000000000000000000000000000000			7 (1) 9 (1) 9 (2) 7 (3) 1 (4)	1 (1) 1 (2) 1 (2) 1 (3)	7.00000	13.20030	8.0000	5.43350	1.00000	1.30000	1.00000	0E00E-4	1.03630	1.33933	1.00000	1.00036	1.00000	1.30000	1.33000	1.03000	173	c	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	100000	.03	4.18	1 m	1.00030	900	100
MINIM	LOUTNIE	.277300E+92	.231JGCE+02	.23100CE+02	.2313565+32	.23160tE+12	.23000CE+02			7	7	•23399CE+02	=	7	-23000CE+32	C.		1"	-	2	+	.1120655+12	9	152110010	.11130EE+92	7		6+3	.116JJEE+J2	E+3	.1150305+02	Ö	E+3	• 111096E+02	.5	0+3	.263000E+02	.203434E+12	0	c	+20300E+02	0	03000E+0	9	1	.198000E+02	• 14000CE+81		.140000E+01	.10433CE+32	• 164366E+02	.1400002+01	.10400CE+02	.14033CE+01
SIGPA			•	£+12	E+12	£+12	E+12	5+12	+ 3	+1	+	4	Ŧ	(+3	+	7	+	7	E + 1	+ 13	+	+	+	7	7	7		7	+	E+32	E+12	E+12	E+12	E+12	E+32	E+12	E+32	E+32	E+12	E+12	E+12	E+12	E+12	E+12	E+12	006+32	7	5+12	3	T	E+12	E+3	E+3	7
MANTMIN	17440	.4230jüE+	00026640	.39663	. 396 i	.49305uE+12	. 456900	.479630	60	900	300	583326	.303000	07080E	E68331	. 456000	.398066	339036	200064.	348646	.308030	.345030	308000	0.0000000000000000000000000000000000000	. 299000	299 000	*408030	55.4 620	. 299 000E	.2993.0	. 299 üüüE+12	. 408006	323406.	3000804.	.593000E+32		.402000	.402000E	.735636	.778600E	.51733EE	. 517030E+32	.648000	3C0849.	.366000E+32	.366000	900494	3950065	.395000	.367000	.395CuCE+	ū	.307636	5
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.200000E+32	.2003365+32	. 2000J0E+32	. 26003tE+32	.2600JUEE+J2	.2000JEE+32	.200030E+32	.47033CE+31	16903CE+31	1603JCE+31	•114000E+02	*151000E+32	.1513JCE+32	.230000E+02	.2283305+02	• 15100E+02	.2280105+32	.15133CE+22	.22833JE+12	.2220305+92	-294445E+32
. 428000E+12	.5020305+32	.366030E+12	. +564300E+32	.470030E+12	. 526JJGE+12	.470000E+12	.254000E+12	.254Gu6E+12	. 184000E+12 ·	.338000E+12	.3360c6E+12.	.3663GGE+12	.396000E+J2	• 456üüGE+12	.3660005+12	.58300CE+12	. 3~6030E+12	+583030E+12	.3660UDE+92	. 503306E+12
											;						:			
75	200	96	25	58	66	9	61	29	9	59	69	99	29	6.9	69	67	71 .	72	73	74

STEP \*\*UMBERS OF IDENTICAL PEAKS AND VALLEYS WHICH OCCUR CONSECUTIVELY IN THE LOAD SPECTRUM

LOAD SPECTRUM DATA AGJUSTED FOR PANGE PAIR COUNTING = 64

A Section

COUNTER K		1.00000	9000.	ပ	C.	00	0	1.30085	0	.3364	2.33300	00	5	() ()	.0000	3100	7770	3 (	3000	9 0	3355	33.6	000	.33	.330	0	C)	3	0 0	9	2000	1.00000	9 0		100	0000	.000	000	0	36	6.40360	00	00	00	000	000	300	000	390	O	363.	• 300	1.00000
HINIMUM	0E+3	23100CE+0	. 231900E+02	0+30	233336E+9			300 30E+0	0 0 0 E + 0	35390E+0	5233CE+3	030E+0	30:30E+0	52336E+3	270005+0	520305+0	24 110 20 21	100	3 4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	144	E + 10	0 = +0	53355+0	. 223536E+31	150005+0	0+300	23336E+0	105+0	636366+0	LE+0	100	100	2 3	7	+	.1403305+01	7	1	9	.154336E+32	7	0+	+0	.20113CE+112	7	7	1	+3	+0	0+336259	6933CE+	0+300
SIGPA	C+30CC	93036E+3	00 0E+0	33CE+3	130E+1	0+3000	306E+3	83346E+1	68900E+3	30005	6305+3	39565+1	3000E+1	080005+3	C C 0 0 E + 3	1005+3		7	100E+1	140000000000000000000000000000000000000	4 300000	1000	14301666	93366+3	301080	493GE+3	350405+3	0006+3	7336E+1	2000E+1	6000E+3	78306E+1	1/CJCE+3	* 643 44 6 F J Z	Standin Ft	4440000	50JUE+3	70005+0	5336E+3	98 03CE+3	07 JCGE+3	37 030E+3	***	20005+3	330E+3	7	+	1	76000E+3	540005+0	4.30ce+3	*18400iE+32	8 0 0 0 E + 0
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306000E+12 456000E+12 506000E+12 506000E+12 583000E+12 583000E+12 563000E+12

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•	HINIMI	.2770366+02		31036E+0	* Cottonelle	230000E+0		30330E+3	04300026	3550CE+3	520 JCE+0	2693EE+3	300000	33445E+3	0+300cc25	04570322	52030219	5233GE+0	520305+3	12000E+0	5210CE+3	11335543	163065+3	200061	163368+3	20338E+3	63362+3	1100000		200005+0	C330CE+0	C35065+0	03000E+0	0+330009	C3230E+3	L 3 C 4 UE + U	04330C60	9890cE+3	04336E+0	4000C+C	C433CE+0	0+3000+0	43636543	C+33CC+3	400000+0	74227777	0000	400000+0	0430000
SIGNA		23030E+1	93006E+1	9600051	50000 F + 12	79000=+1	42CCCE+12	+75	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	286336+3	0800CE+3	683365+3	566305+3	********		6893GE+1	080002+3	4550cE+3	080365+3	080002+3	1437966	. 4 11 11 11 10 10 10 10 10 10 10 10 10 10	14 3000 80 14 3000 80	045005+0	995388+3	995ccE+3	T+100006	14 30 0 0 VC	ではなっている。	93000E+3	17 C 33E+3	32030E+3	360335+3	780635+3	17 JJGE+1	( + dpr. a 6 b	1 4 4 9 1 1 9 9	64.000043	6+300056	95006E+1	070305+3	95000E+0	980005+3	07 136E+3	07 000E+J	1 4 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		646306+3	70036
	STEP	•	<b>N</b> 1	m s	יט ד	•	2	∞ (	T ===		12	13	<b>4</b>	15	17	44.8	19	2.6	21	223	200		, w	22	28	29	n m	3 0 1	3 2 2 3 3 4 3 4 4 4 4 4 4 4 4 4 4 4 4 4	n .ar	w w	36	37.	80	on.	7 -	L 1	4	11	45	94	24	TO (	T (	901	10	מור	50.00	55.

1.1.

.2000105402 .2000105402 .2000105401 .4701055401 .1141005401 .1510105402 .2301005402 .2540105402 .2540105402 .2540105402 .2540105402

.526000E+12 .254000E+12 .254000E+12 .254000E+12 .336000E+12 .346000E+12 .346000E+12 .36600E+12 .36600E+12 .36600E+12 .36600E+12 .36600E+12

APPENDIX II
PROGRAM LISTING

18 2606 (11) (STRAKATI), STRENKTI), SHOUTCII), I = 1,100KS)  18 10 10 00A1 (154, 151.2)  19 10 10 00A1 (114, 151.4)  19 10 00A1 (114, 151.4)  10 10 11	PROGRAH	A PCM		TRACE CDC 6606 FTN V3.0-320A OPT=0	11/20/72 15.	15.44.26. PA	PAGE 2	
19 FORMATICE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			READ (5,10	AX(I), SIGHIN(I), RNCVC(I), I =				
######################################			90 8563 I	J = 1,NPKS			:	3
### ##################################		8003	NSTEP(I)					
######################################			WRITE(6,1	LE(I), I =				•
22 FORMATICHA, 56HTHE NUMBER OF PEAKS OR JALLEYS IN THE INDUT LOAD SPE 22 FORMATICHA, 56HTHE NUMBER OF PEAKS OR JALLEYS IN THE INDUT LOAD SPECTAUY  4 SPECIAL SET (MSTEPLI), 52GHAKII, 53GHHMII, PROVCII), I = 1, NPKS)  52 FORMATICAY, 15, 10X, E13.6, 13X, F1L.5)  C GOUNTER K IS LESS THAN 1.3  C GOUNTER K IS LESS THAN 1.3  1 = 1  NCVNG = 110  NC	٠	1	WRITE(6,2	STON NPKS				
22 FORMAT(63.2)  4 FITE(6.22)  4 FORMAT(63.2)  5 FORMAT(63.2)  5 FORMAT(63.2)  5 FORMAT(63.2)  5 FORMAT(63.2)  5 FORMAT(62.2)  6 COUNTER K IS LESS THAN 1.0  1 L = 6  1 L		23	FORMAT (1H	NUMBER OF	ld			
22 FORMATICAX SHRINGER X)  24 FORMATICAX SHRINGER X)  25 FORMATICAX SHRINGER X)  26 FORMATICAX STATEPLIAX SHARK SHARK SHARK STATEPLIAX SHARK SHA	99		WRITE(6,2	122)				
######################################	٠	22	FORMAT (63	53X,5HSIGMA/31X,4HSTEP,13X,7HMAXIMUM,16X,7HMINIMUM,13X,				
C SORT THROUGH THE LOAD SPECTRUY - PULL OUT THOSE PEAKS AND VALLEYS IN 1.3  L = 1  L = 5  NFS = 1  NCYNG = 100  JO 10. I = 1,NPKS  IF (RNCYCII) . GE. 1.C) GO TO 180  X1 = 51GNAKII)  X2 = 51GNAKII)  X2 = 51GNAKII)  X3 = 51GNAKII)  X4 = 51GNAKII)  X4 = 51GNAKII)  X5 = 51GNAKII)  X6 = 1.00  X7 = 1.00  X8 = 1.00  X8 = 1.00  X9 = 1.0			WRITE(6,2	1), SIGMAX(I), SIGMIN(I), RNCYC(I), I = 13.6.13x. F13.6.13x. F13.6.13x.		*		
C GOUNTER K IS LESS THAN 1.3  J = 1  L = 5  NPES = 1  NP								,
L = 5  NESS = 1  NESS = 1  NESS = 1  NESS = 1  OO 13			SORT THRO	AD SPECTRU4 - PULL OUT THOSE PEAKS HAN 1.0	WHOSE			
NETS = 1			11		:			
NPESS = 1  NPESS = 1  NPENCE = 1.0  DO 11	75		25					
JUNE 0 0 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				eee				
TE CANDER   TE AND THE			, ,					
If (RMCVC(I) .GE. 1.C) GO TO 100   X1 = SIGHAXII)   X2 = SIGHAXII)   CALL (CGCENXI,X2 ,RMCYC(I), VSTEP(I))   ISAVE(J) = I   J = J + 1   L = ISAVE(J) = I   J = J + 1   L = ISAVE(J) = I			1 36 T	T = 1, NPKS				
X1 = SIGMAXII)  X2 = SIGMAXII)  ISAVE(1) = 1  130 CALL CYGEN(X1,X2 ,RNCYC(I), VSTEP(I))  ISAVE(1) = 1  130 CONTINUE  INFX = J + 1  INFX = J +	٠.		( RNC YC	.GE. 1.C)				
CALL CYGGENIALIA (ACCID), USTEP(I))  ISAVE(J) = 1  J = 14  J =	•		X1 = SIGN	SAAK(I)				
ISAVE(J) = 1			CALL CYCG					
100 CONTINUE  100 CONTINUE  110 CONTINUE  111 CHAX = 0 - 1  NEKSN = NPKS - JMAX  112 CHAX = 0 - 1  113 FCRMAT(1HG,93HSTEP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD  124 FCRMAT(1HG,93HSTEP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD  125 FCRMAT(1HG,93HSTEP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD  126 TO 11C J = 1, JMAX  127 FCR TRUM HOSE COUNTER K IS LESS THAN 1.C//(1777)  128 FCR AX (11) = 15 FCR AX (11+1)  128 FCR AX (11) = 15 FCR AX (11+1)  128 FCR AX (11) = 15 FCR AX (11+1)  129 FCR AX (11) = 15 FCR AX (11+1)  130 FCR II) = NT FCR (11+1)  1415 FCR II) = NT FCR (11+1)  142 FCR III = NT FCR (11+1)  143 FCR III = NT FCR (11+1)  144 FCR III = NT FCR (11+1)  145 FCR III = NT FCR (11+1)  146 FCR III = NT FCR (11+1)  147 FCR III = 1, NFKSN)  148 FCR III = 1, NFKSN)  149 FCR III = 1, NFKSN)  150 FCR III = 1, NFKSN)  160 FCR III = 1, NFKSN)  170 FCR III = 1, NFKSN)  171 FCR III = 1, NFKSN)  171 FCR III = 1, NFKSN)  172 FCR III = 1, NFKSN)  173 FCR III = 1, NFKSN)  174 FCR III = 1, NFKSN)  175 FCR III = 1, NFKSN)  175 FCR III = 1, NFKSN)  175 FCR III = 1, NFKSN)  176 FCR III = 1, NFKSN)  177 FCR III = 1, NFKSN)  177 FCR III = 1, NFKSN)  178 FCR III = 1, NFKSN)  179 FCR III = 1, NFKSN III II III III III III III III III II			ISAVE(J)					
130 CONTINUE  JMAX = J - 1  NFKSN = NPKS - JHAX  IF (JMAX .EQ . 0) GO TO 200  HRITE(6,23) (ISAA[KK), K = 1,JMAX)  23 FCRMAT(1104) 934787FP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD  1 SPECTRUM WHOSE COUNTER K IS LESS THAN 1.C/(1717))  10 11C J = 1,JMAX  I = ISAVE(J) - (J-1)  NPKN = NPKS - J-1)  NPKN = NPKS - J-1)  NPKN = NPKS - J-1)  NPKN = NFS - J-1)  NSTEP(II) = SIGHN(II)+1)  NSTEP(II) = NSTEP(II+1)  NSTE			1 + 7 = 7					
NFKSN = NPKS - JHAX							•	
IF (JMAX .Eq. 0) GO TO 200  HRITE(6,23) (ISAJE(K), K = 1,JMAX)  23 FORMAT(140,93HSTEP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD  15 SPECTRUM HOOSE COUNTER K IS LESS THAN 1.C/(1717))  16 15 JANE(J) - (J-1)  17				1000				
PRITE(6,23) (ISAJE(K), K = 1,JMAX)  28 FORMAT(140,93HSTEP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD  18 FORMAT(140,93HSTEP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD  19 11.JMAX  1 = ISAVE(J) - (J-1)  10 11. JMAX  1 = ISAVE(J) - (J-1)  11			IF CJMAX	• EQ • 0) GO TO				
23 FCRMAT(140,934SIEP NUMBERS OF THOSE PEAKS AND VALLEYS IN THE LOAD 1 SPECTRUM HOSE COUNTER K IS LESS THAN 1.C//(1717)) 00 11C J = 1,JMAX  I = ISAVE(J) - (J-1)  NPKN = NPKS - J  IF (I .EG. NPKN) GO TO 110  DO 115 II = I,NPKN  SIGMAX(II) = SIGMAX(II+1)  SIGMAX(II) = SIGMAX(II+1)  NSTEP(II) = NSTEP(II) + SIGMAX(II+1)  NSTEP(II) = RNCYC(II+1)  115 CONTINUE  116 CONTINUE  117 CONTINUE  118 CONTINUE  119 CONTINUE  110 CONTINUE  110 CONTINUE  111 CONTINUE  111 CONTINUE  112 CONTINUE  113 CONTINUE  114 CONTINUE  115 CONTINUE  116 CONTINUE  117 CONTINUE  118 CONTINUE  119 CONTINUE  110 CONTINUE  110 CONTINUE  111 CONTINUE  112 CONTINUE  113 CONTINUE  114 CONTINUE  115 CONTINUE  116 CONTINUE  117 CONTINUE  118 CONTINUE  119 CONTINUE  110 CONTINUE  110 CONTINUE  110 CONTINUE  110 CONTINUE  111 CONTINUE  112 CONTINUE  113 CONTINUE  114 CONTINUE  115 CONTINUE  116 CONTINUE  117 CONTINUE  118 CONTINUE  119 CONTINUE  110 CONT			HRITE(6,2	K), K = 1				
1 = ISAVE(J) - (J-1)  NPKN = NPKS - J  I = ISAVE(J) - (J-1)  NPKN = NPKS - J  IF (I .EG. NPKN) GO TO 110  DO 115 II = I,NPKN  SIGHAX(II) = SIGHAX(II+1)  SIGHAX(II) = SIGHAX(II+1)  NSTEP(II) = RNCYC(II+1)  NSTEP(II) = RNCYC(II+1)  ANTEC(S, 24) NPKSN  HRITE(G, 25) (NSTEP(I),SIGHAX(I),SIGHIN(I),RNCYC(I), I = 1,NPKSN)  200 CONTINUE  NRIFE(G, 25) (NSTEP(I),SIGHAX(I),SIGHIN(I),RNCYC(I), I = 1,NPKSN)  SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS HITH IDENTICAL  AND VALLEYS WHICH OCCUR CONSECUTIVELY			FORMAT (1H	NUMBERS OF THOSE PEAKS				
I = ISAVE(J) - (J-1)  NPKN = NFKS - J  IF (I .EG. NPKN) GO TO 110  DO 115 II = I,NPKN  SIGHAX(II) = SIGHAX(II+1)  SIGHIA(II) = SIGHIA(II+1)  NSTEP(II) = RNCYC(II+1)  115 CONTINUE  110 CONTINUE  HRITE(G,24) NPKSN  HRITE(G,22) (NSTEP(I),SIGHAX(I),SIGHIN(I),RNCYC(II), I = 1,NPKSN)  200 CONTINUE  SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS HITH IDENTICAL  AND VALLEYS WHICH OCCUR CONSECUTIVELY		•	00 11C J :	IER N 13 LESS		:	:	
NPKN = NPKS - J  NPKN = NPKS - J  NPKN = NPKS - J  IF (I .EG. NPKN) GO TO 110  DO 115 II = NICHAK(II+1)  SIGHAX(II) = SIGHAX(II+1)  NSTEP(II) = RNCYC(II+1)  115 CONTINUE  110 CONTINUE  NRIFE(6,24) NPKSN  HRIFE(6,22)  HRIFE(6,22)  CONTINUE  SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS WITH IDENTICAL  AND VALLEYS WHICH OCCUR CONSECUTIVELY			I = ISAVE	F(J) - (J-1)				
IF (I *EO. NPKN) GO TO 110  10 115 II = I.MFKN  SIGHAX(II) = SIGHIH(II+1)  SIGHAX(II) = SIGHIH(II+1)  NSTEP(II) = NSTEPIII+1)  RNGCC(II) = RNCYC(III+1)  RNGCC(II) = RNCYC(III+1)  RNGCC(II) = RNCYC(III+1)  RNGCC(II) = RNCYC(III+1)  RNITE(6,24) NPKSN  HRITE(6,22)  HR			NPKN = NP					
SIGHAX(II) = SIGHAX(II+1) SIGHAX(II) = SIGHIX(II+1) NSTEP(II) = NSTEP(II+1) RNCYC(II) = RNCYC(III+1) RNCYC(II) = RNCYC(III+1) RNCYC(II) = RNCYC(III+1) RNCYC(II) = RNCYC(III+1) RNTE(6,24) NPKSN HRITE(6,22) HRITE(6,22) HRITE(6,22) HRITE(6,22) HRITE(6,22) SORT THROUGH THE LOAD SPECTRU4 DATA - COMBINE STEPS HITH IDENTICAL AND VALLEYS WHICH OCCUR CONSECUTIVELY			IF (I .EQ	0 :				
SIGNIN(II) = SIGNIN(II+1)  NSTEP(II) = NSTEP(II+1)  ANCYC(II) = RNCYC(II+1)  ANCYC(II) = RNCYC(II+1)  ANCYC(II) = RNCYC(II+1)  ANTE(6,24) NPKSN  WRITE(6,22)  WRITE(6,25)  WRITE(6,25)  WRITE(6,25)  WRITE(6,25)  C SORT THROUGH THE LOAD SPECTRU4 DATA - COMBINE STEPS WITH IDENTICAL  C AND VALLEYS WHICH OCCUR CONSECUTIVELY		. •	STEMAX (TT	2 5				
NSTEP(II) = NSTEP(II+1)  115 CONTINUE  110 CONTINUE  110 CONTINUE  111 CONTINUE  111 CONTINUE  112 CONTINUE  113 CONTINUE  114 CONTINUE  115 CONTINUE  116 CONTINUE  116 CONTINUE  117 CONTINUE  118 CONTINUE  119 CONTINUE  119 CONTINUE  119 CONTINUE  120 C		•	STOMINGIT	ATACTA #				
RNCYC(II) = RNCYC(II+1)  115 CONTINUE  110 CONTINUE  WRITE(6,24) NPKSN  WRITE(6,22)  WRITE(6,25) (NSTEP(I),SIGHAX(I),SIGHIN(I),RNCYC(I), I = 1,NPKSN)  200 CONTINUE  SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS WITH IDENTICAL  AND VALLEYS WHICH OCCUR CONSECUTIVELY		Ī	NSTEP(II)	= NSTEPLT				
115 CONTINUE 110 CONTINUE 110 CONTINUE HRITE(6,24) NPKSN HRITE(6,24) (NSTEP(I),SIGHAX(I),SIGHIN(I),RNCYC(I), I = 1,NPKSN) 210 CONTINUE SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS HITH IDENTICAL AND VALLEYS WHICH OCCUR CONSECUTIVELY			RNCYC(II)	= PNCYC(I			t .	
110 CONTINUE HRITE(6,22) HRITE(6,22) HRITE(6,22) HRITE(6,22) HRITE(6,22) CONTINUE SORT THROUGH THE LOAD SPECTRU4 DATA - COMBINE STEPS HITH IDENTICAL AND VALLEYS WHICH OCCUR CONSECUTIVELY			CONT INUE				•	
HRITE(6,22) HRITE(6,22) HRITE(6,22) HRITE(6,22) CONTINUE SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS HITH IDENTICAL AND VALLEYS WHICH OCCUR CONSECUTIVELY		_	CONTINUE					
HRITE(6,22) HRITE(6,25) (NSTEP(I),SIGHAX(I),SIGHIN(I),RNCYC(I), I = 1,NPKSN) CONTINUE SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS HITH IDENTIGAL AND VALLEYS WHICH OCCUR CONSECUTIVELY			WRITE(6,Z		:			
SORT THROUGH THE LOAD SPECTRUY DATA - COMBINE STEPS WITH IDENTICAL AND VALLEYS WHICH OCCUR CONSECUTIVELY		200	WRITE(6,2) CONTINUE	(NSTEP(I), SIGHAX(I), SIGHIN(I), RNGYG(I), I =				:
67			SORT THRON	COMBINE			+	
67							٠	i

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PROGRAM	RPCM TRACE CDC 6600 FTN V3.0-326A OPT=0 11/20/72	2 15.44.26. PAGE 3
		Company and the second
	00 336 I = 2,NPKSN	
115	IF (SIGNAXI) .NE. SIGNAX(I-1) GO TO 300	
	STRUTUITION CO TO	
	RNCYS(I-1) = RNCYC(I-1) + RNCYC(I)	
	T + T H T T T T T T T T T T T T T T T T	
126		
7		
	19 JHAS)	
		The second secon
125	ייי דור האים	
	I = ISAVE(J) - (J-1)	
	NPKN = NPKN - D TO 344	
	•	
130	SIGHAX(II) = SIGHAX(II+1)	The state of the s
	I = SIGHI	
	= NSTEP	!
	ZAG CONTINUE KNOTO(II+I)	
135	311 CONTRUE	
		The state of the s
	24 FOR411(1H1,54HLOAD SPECTRUM D11A ADJUSTED FOR RANGE PAIR COUNTING	
140		
	HRITE(6,25) (NSTEP(I),SIGHAX(I),SIGHIN(I),RNCYC(I), I = 1.NPKYN)	
	DIENT THE ADMINISTED 1 040 S GEOTOWN	
		4
145	6933	
		The state of the s
	1	
	L CANAL	
156	2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	
	(RNCYC(I) .GT. 1.0	
	( KB .NE. 0	The second secon
7 2 2	X1 in SIGMAK(I)	
160	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	The transfer of the second sec
•	- 11	
	X = 4X	
	IND3 = NSTEP(I)	
165	FORT FORT	
*		

PROGRAM	RPCH TRACE	CDC 6603 FTN V3.0-320A OPT=0 11/20/72 15.44.26. PAGE 4
	KMAX = 0	
	K31 = 0 IF (RNCYC(I) .EQ. 1.L) GO TO S	
	-	
17.0	KIND = 1 GO TO 415	
	Q	
	GALL DECIDERY CALLERY TO	NEW CONTRACTOR CONTRAC
175	1 10 20 GG TO (12, 12, 30), KCYGEN	CYGEN
	13 KB = 1 IF (KHIN . AS. 1) GO 10 36	
	1 + 1 + 1 = 1	
6	IF (I .LE. MPKSN) GO TO 5	
001	RES(LR+1) = X1	
	INDEXCLR+1) = IND1	
	INDEX(LR+2) = IND2	
185	GO TO 2003	***************************************
	30 IF (KMIN .NE. 1) GO TC 35	
	T + I = 1	
	RFS(10+1) = X1	
198	RES(LR+2) = X2	
	RES(LR+3) = x3	
	INDEX(LR+1) = INO1.	
	TANGENTER (2 TANGE	
195	LRMAX = LR + 3	
	GO TO 2433	
	31 X4 = SIGMAX(I) IND4 = NSTEP(I)	
	KMAX = 1	
236	KEIN # C	
	32 IF (RNGYC(I) 6GT 1.0) GO TO 40	
	60 TO 6	
245	AS KEY II 1	
	35 X4 = SIGMIN(I)	
:	IND4 = NSTED(I)	
210	T II XXXX	
	K31 = 0	The second secon
	G0 T0 32	# Parties
	36 X3 = SIGMIN(I)	
215	KMIN = 1	Transmission december the property of the prop
	KNAX II G	
	430 KEY = 1	
226	X1 = SIGMAX(I)	The state of the s

PROGRAM	RPCM TRACE	CDC 6603 FTN V3.3-32JA OPT=J 11/20/72	15.44.26.	PAGE 5	
	X = SIGNIN(I)				
•					
	11	-			
	TNI = NSTEP(T)				
225	IND2 = IND1			,	
	IND3 = IND1			÷ .	
:	н	Transfer to the second of the	na da manamananan menanan ar a mandadahan samunianda sabah-dapatan da s	Minister express . I in the second second second second in the second se	
	KMIN = 1				
	KMAX = 0				•
230					
	09 (3.	10 401		•	
	RNCYC(I) = RNCYC(I) - 1.0				
	50 10 462				1
	431 RNCYC(I) = RNCYC(I) - 2.3				
235	CNIX				
	05				
	CIDARDIN I SX CITA				
	0				
0.20	THOS = MOICE (T)				
2				:	•
	-				1
	O I ONLY				
376	TI JAJAG - TI			en franche de se de designations de la separate a la designation de se de la seconda d	1
0.00	TI - KINCICITI				_
	TI JONOR - CHONO SE				:
	TEST OFFICE SECTIONS AS	T.CVCND, KCVGENI			
	COLE DECIDENTANCES AND			٠	٠,
25.0	TOTAL DESCRIPTION				
				To the state of th	
	SALE FORMAT (141.27 HMFH9FR) OF RESTAUR SPECTRUM. TS.3H	THE SPECTRUM.15.3H = . 15//.55x.			
	HRITE(6,2002) (RES(D), INDEX(D).	.D. J. T. LEMAX)			. ,
255	2102 FORMAT (50X.E15.6.10X.15)	)			
	WRITE(6,2303) NRES,LMAX				
	2363 FORMAT (1H1, GENCYCLES GENERATED	EJ BEFORE RESIDUE SPECTRUM, 15,3H = ,			-
	115//)				
					:
260	WRITE(6,25) (NNSTEP(I),CY(	<pre>EP(I),CYCLE(I,1),CYCLE(I,2),RNECYC(I),</pre>			
	# H		F		
	6 (4				
:	(NCYNO .EQ. 6) 60 TO	The second secon	made can in Assault de con in the property of the contract of	der and bier day with the same to be the same of the s	
592	RANGE PAIR COUNT OF	RESIDUE SPECTRUMS			
					-
	NRES = NRES + 1				:-
	CALL DECRES(LRMAX, NCYNO)				
	TO THE PROPERTY OF THE PARTY OF				
	STOR TE CERTIFY SEES TO				:
	C COUNT THE LAST RESIDUE SPECTRUM	RUM - RANGE PAIR COUNTING HILL YIELD NO			
	C ADDITIONAL CYCLES				
275	)   X   1		*	de en eige en de en	- Inc
					-
		•			
		45			

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### ### ### ##########################	PROGRAM	SPCM	TRACE	CDC 6603 FTN V3.3-320A OPT=0	0 11/20/72	15.44.26.	PAGE	w	
RESMIN = RES(11)  IMAX = 1  IMAX = 1  IMAX = 1  RESMIN = RES(11)  IMAX = 1  Substitute  CALL CYCRES(RESMAX  KK = KK + 1  Substitute  CALL CYCRES(RES(J)  KK = KK + 1  IMAX = 2  IF (J = 6T > 60 T  CALL CYCRES(RES(J)  KK = KK + 1  IMAX = 1			- 1						
IMAX = 1  IMAX = 1  IMAX = 1  OD 560  EESMAX = RES(1)  IMAX = 1  GO 10 500  CALL CYCRES(RESMAX  KK = KK + 1  S10 J = IMAX - 2  IF (J = LE + 2)  CALL CYCRES(RES(J)  KK = KK + 1  IMAX = J  GO TO 550  GO TO 550  GO TO 550  FF (J = LE + AX)  CALL CYCRES(RES(J)  KK = KK + 1  IMAX = J  GO TO 550  GO TO 550  FF (J = LE + AX)  CALL CYCRES(RES(J)  KK = KK + 1  IMAX = L  IMAX = L  IMAX = L  KK = KK + 1  IMAX = L  IMAX = L  KK = KK + 1  IMAX = L  IMAX = L  IMAX = L  IMAX = L  KK + 1  IMAX = L  IMAX = L  KK + 1  IMAX = L  IMAX = L  IMAX = L  KK + 1  IMAX = L  KK + 1  IMAX = L  KK + 1  IMAX = L  IMAX = L  KK + 1  IMAX = L  KK + 1  IMAX = L  IMAX = L  KK + 1  IMAX = L  IMAX = L  KK + 1  IMAX = L  IMAX = L  KK + 1  IMAX = L  IMAX =		E WOOD CO	11			:	:	:	-
IMIN = 1  THIN = 1  THEST ID * LT RE RESHAX = RES (1)  THAX = 1  GO TO 500  GO TO 500  THIN = 1  SU GONTINUE  CALL CYCRES (RESHAX  KK = KK + 1  THAX = 1  GO TO 510  S50 J = IHAX - 2  IF (J * LE* AX)  CALL CYCRES (RES (J)  KK = KK + 1  IHIN = 1  GO TO 550  GO TO 550  S50 J = IHIN + 2  IHIN = 1  GO TO 550  S75 KMAX = KK + 1  IHIN = 1  GO TO 550  S75 KMAX = KK + 1  IHIN = 1  GO TO 550  S75 KMAX = KK + 1  IHIN = 1  GO TO 550  S75 KMAX = KK + 1  IHIN = 1  IHIN = 1  IN STEP (L) = KP  KK = KK + 1  KK = KK		IMAX	-						
The control of the		NHWI	11						
IF (RES(I) . LT. RE  RESMAX = RES(I)  I 0 0 0 0 0  I 0 0 0 0 0  I 0 0 0 0 0  I 0 0 0 0	88	200	TE 2-1 PMAX						
RESHAX = RES(I)  1		TF	60 10						
IMAX = I  S.D. GONTRNUE  CALL CYCRES(RESMAX CALL CYCRES(RESMAX CALL CYCRES(RESCA)  KK = KK + 1  I S.D. GONTRNUE  CALL CYCRES(RESCA)  KK = KK + 1  I MAX = J  GO TO 550  S50 J = IMAX = L  I MAX = L  I MAX = J  GO TO 550  S75 KMAX = KK + 1  I MIN = J  GO TO 550  S75 KMAX = KK + 1  I MIN = J  GO TO 550  S75 KMAX = K  KK + 1  I MIN = J  KK + 1  I MIN = L  HRITE(6,205) KMAX  CA = KK + 1  I MAX = L  HRITE(6,205) KMAX  CA = C  SORT THE ANALYSIS  CA = C  SORT THE ANALYSIS  CA = C  SOGMAN(KP) = KP  KK = KP + 1		RESM			٠				į
GO TO SGO  493 IF (RESII) .GT. RE  RESNIN = I  IMIN = I  SGO CONTINUE  CALL CYCRES(RESMAX  KK = KK + 1  IMAX = J  GO TO STO  SSO J = IMAX + 2  IF (J .EF. 2) GO T  CALL CYCRES(RES(J)-  KK = KK + 1  IMAX = J  GO TO STO  SSO J = IMAX  LMAX = K  KMAX = KK + 1  IMAX = J  GO TO SSO SSO SES(J)-  KK = KK + 1  IMAX = J  GO TO SSO SSO SES(J)-  KK = KK + 1  IMAX = J  GO TO SSO SSO SSO SSO SSO SSO SSO SSO SSO		XUHI	11						
## ## ## ## ## ## ## ## ## ## ## ## ##		1 09	0 500						
RESMIN = RES(I)  SUD IMIN = I  CALL CYCRES(RESMAX  KK = KK + 1  IF (J = LHAX = J  GALL CYCRES(RES(J))  KK = KK + 1  IF (J = GT + LRAX)  GALL CYCRES(RES(J)  KK = KK + 1  IF (J = GT + LRAX)  GALL CYCRES(RES(J)  KK = KK + 1  ININ = J  GO TO 550  SFS KMAX = KK  LMAX = L  KK = KK + 1  ININ = J  GO TO 550  SFS KMAX = KK  LMAX = L  KK = KK + 1  ININ E G, 20 G)  WRITE(G, 20 G)  I = 1, LMAX  C SORT THE ANALYSIS  C  SORT THE ANALYSIS  C  SORT THE ANALYSIS  C  SORT THE ANALYSIS  C  SORT THE ANALYSIS  C  SORT THE ANALYSIS  C  SORT THE ANALYSIS  C  SOGMAX(KP) = KP  KC = KC + 1  NSTEPK(P) = CYCLE  KR = KP + 1  NSTEPK(P) = CYCLE  SIGMIN(KP) = CYCLE  F (SIGMIN(KP) = NOYCE  F (SIGMIN(KP) = NOYCE  F (SIGMIN(KP) = ROYCE  F (SIGMIN(KP) = ROY	35		. GT. RESMIN) GO TO	500					
IMIN = I  GONTRAUG  CALL CYCRES(RESMAX  KK = KK + 1  I J = IMAX - 2  I F (J • (E • 2) = 00 T  I MAX = J  GO TO 510  55J J = IMIN + 2  IF (J • (T • (E • 2) = 0)  KK = KK + 1  I MIN = J  GO TO 55G  STE (MAX = KK + 1  I MIN = J  GO TO 55G  STE (MAX = K  KMAX = KK + 1  I MIN = J  GO TO 55G  STE (MAX = K  HRITE(6,20 ES) KMAX  COUNTING = HRITE(6,20 ES) KMAX  STE (MAX = K  HRITE(6,20 ES) KMAX  COUNTING = HRITE(6,20 ES)  MRITE(6,20 COUNTING = HRITE(6,20 ES)  MRITE(6,20 COUNTING = I + I + I + I + I + I + I + I + I + I	-		S(I)						
5.0 GONTINUE CALL CYCRES(RESMAX K = KK + 1  IF (J *LE* 1) GO T  CALL CYCRES(RES(J) KK = KK + 1  IMAX = J  GO TO 510  550 J = IMAX + 2  IF (J *LE* 1)  GO TO 550  FOR = KK + 1  IMAX = J  KK = KK + 1  IMAX = L  HAX = L  GO TO 50  SORT THE ANALYSIS  C  SORT THE ANALY		NIKI	11						
CALL CYCRES(RESMAX + 1			INUE		•				i
KK = KK + 1  I			ESCRESHAX	INDEX(IMAX))					
510 J = IMAX - 2  CALL CYCRES(RES(J)  KK = KK + 1  I MAX = J  GO TO 510  550 J = IMIN + 2  GALL CYCRES(RES(J)  KR = KK + 1  I MIN + 2  GALL CYCRES(RES(J)  KR = KK + 1  I MIN + 2  GO TO 550  575 KMAX = KK  LMAX = K  HRITE(6,209) KMAX  10E PAIR COUNTING = MRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,23)  WRITE(6,23)  WRITE(6,24)  LMAX  C  SORT THE ANALYSIS  C	06	×	KK + 1						
IF (J .LE. 1) GO T  CALL CYCRES(RES(J)  K = KK + 1  IMAX = J  GO TO 510  55J J = IMIN + 2  IF (J .61 - LRMAX)  CALL CYCRES(RES(J)-  KK = KK + 1  IMIN = J  GO TO 550  KK = KK + 1  IMIN = J  GO TO 550  FORMAX = K  KMAX = K  KMAX = L  HRITE(6,205) KMAX  2J 65 FORMAI (141,7HCYCL  1GE PAIR COUNTING =  MRITE(6,25) (WNSTE  C SORT THE ANALYSIS  C SORT			MAX -	•					_
CALL CYCRESCRES(J)  KK = KK + 1  INAX = J  GO TO 510  553 J = ININ + 2  ININ = J  CALL CYCRES(RES(J)  KK = KK + 1  ININ = J  O TO 550  KK + 1  ININ = J  O TO 550  FRANTIE(6,230)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  CO 500  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  CO 600  SORT THE ANALYSIS  CO 600  SORT TH			1) 60 1						
THAX = 1     THAX = 1     GO TO 510     GO TO 510     CALL CYCRES(RES(J-KAX)     CALL CYCRES(RAX     C		CALL	CYCRESTRES(J)	0, INDEX(J))					
IMAX = J 0 0 TO 510 55J J = IMIN + 2 IF (J .6T. LRHAX) CALL CYCRES(RES(J- KM K = KK + 1 IMIN = J 60 TO 55D 575 KMAX = KK LMAX = KK LMAX = KK LMAX = KK LMAX = KK LMAX = KK HRITE(6,205) KMAX 16E PAIR COUNTING = MRITE(6,205) KMAX 16E PAIR COUNTING = MRITE(6,205) KMAX 1		X X II	* * *						!
650 J = IMIN + 2  IF (J = 6T* LRHAX)  CALL CYCRES(RES(J- KM X = KK + 1  IMIN = J GO TO 550  575 KMAX = KK LMAX = K LMAX = K LMAX = L HRITE(6,209) KMAX  2J65 FCR4AT (141,71407CL  1GE PAIR COUNTING = HRITE(6,20)  WRITE(6,20)  WR	95	IMAX	7						
The control of the									•
IF (J .61° LRMAX)  GALL CYCRES(RESKJ- KK = KK + 1  IMIN = J  GG TO 559  575 KMAX = K  LMAX = L  HRITE(6,2305) KMAX  2JG5 FCRAIT (111,714/CVCL  1G6 FORMAT (111,714/CVCL  MRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  WRITE(6,22)  INNETE(1,22)  C SORT THE ANALYSIS			-						
GALL CYCRES(RES(J- KK = KK + 1  IMIN = J  60 T0 559  575 KHAX = KK  LMAX = L  HRITE(6,205) KMAX  2J65 FCRAMT (H1,1)14CYCL  165 PAIR COUNTING =  MRITE(6,22) (MNSTE  1 = 1  C  SORT THE ANALYSIS  C  SOR THE ANALYSIS  C  SORT THE ANALYSIS  C  SORT THE ANALYSIS  C  SOR		1 H					•		
I HIN = J 60 T0 559 60 T0 559 KMAX = KK LMAX = L MRITE(6,206) KMAX 16E PAIR COUNTING = WRITE(6,22) WR		CALL	CYCKESTRESTS-	U+INGEX (J-1))					
1		XX + 1	KK + 1				****		
F75 KMAX = KK LMAX = L HRITE(6,20.05) KMAX LOG FCRATI(111,714CyCL 10E PRESCRIT COUNTING = MRITE(6,25) (NNSTE  RRITE(6,25) (NNSTE  C SORT THE ANALYSIS C SORT THE ANALY		2100	7						
LMAX = L  HRITE(6,2065) KWAX 2JG5 FCWAM (111,714070CL  1GE PAIR COUNTING = MRITE(6,22) (WNSTE  C  SORT THE ANALYSIS  T  SORT THE ANA			1 22						;
2.05 FCRMAT(141,714CYCL 10E PAIR COUNTING = WRITE(6,22) WNSTE 1			2 _						
2JGS FCRMAT (1H1,71HCYCL 1GE PAIR COUNTING = WRITE(6,22) (WNSTE 1	ď	1103	FIG. 2005) KMAX						_
16E PAIR COUNTING = WRIFE(6,25) (WNSTE 6,25) (WNSTE 6,25) (WNSTE C 3333) KP = C 3333) KP = C 33333 KP = C 344 KP = 1			AT CIHI, ZIHCYCI FO GENERATED			-			
HRITE(6,22) (NNSTE  BRITE(6,25) (NNSTE C SORT THE ANALYSIS C SORT			AIR COUNTING = ,15)						
HRITE(6,25) (ANSTE  C SORT THE ANALYSIS  C SO 6 G I = 1, NPKS  KC = C		WRIT	E(6,22)						
C SORT THE ANALYSIS C SORT THE ANALYSIS C SJJJ KP = C DO 6US JJ = 1,NPKS KC = D DO 6UC I = 1, MPKS KC = KC + 1 KC = KC		HRIT	E(6,25) (WNSTEP(I), CYCLE(I,	(,1),CYCLE(I,2),RNECYC(I),					
C SORT THE ANALYSIS C 3353 KP = C C 3353 KP = C D 06 655 JJ = 1,NPKS KC = C D 06 66C I = 1,LMAX IF (NNSTEP(I) "NE. KP = KP + 1 KC = KC + 1 KC C LC - S SIGMAX(KP) = CYCLE SIGMAX(KP) = CYCLE SIGMAX(KP) = CYCLE RICYC(KP) = RHECYC IF (KC LC LC - 2) C IF (SIGMAX(KP) "NE F S95 KP = KP - 1 KOYC(KP) = RNCYC F C LC - 2 F C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C - 1 F C C C C - 1 F C C C C - 1 F C C C C - 1 F C C C C - 1 F C C C C - 1 F C C C C - 1 F C C C C - 1 F C C C C C - 1 F C C C C C C C C C C C C C F C C C C C	01		Ħ						•
C SORI THE ANALYSIS C 33.9.3 KP = C C 33.9.3 KP = C D									
3333 KP = 6 00 645 JJ = 1,NPKS KC = 0 00 66 I = 1,LMAX IF (NNSTEP(I) .NE. JJ) GO TO 500 KP = KP + 1 KC = KC + 1 NSTEP(KP) = KP SIGMAX(KP) = CYCLE(I,1) SIGMAX(KP) = CYCLE(I,2) RNCYC(KP) = RNCYC(I) IF (SIGMAX(KP) .NE. SIGMAX(KP-I)) GO TO IF (SIGMAX(KP) .NE. SIGMAX(KP-I)) GO TO S95 KP = KP - 1 RNCYC(KP) = RNCYC(KP) + 1.5 633 GONTINUE				PRODUCE THE RANGE PAIR COUNTED SE	PECTRUM		•		
00 605 JJ = 1,NPKS  KC = 0  00 6cC I = 1,LMAX  IF (NNSTEP(I) .NE, JJ) GC TO 500  KP = KP + 1  KC = KC + 1  NSTEP(KP) = CYCLE(I,1)  SIGMAX(KP) = CYCLE(I,2)  RNCYC(KP) = RNECYC(I)  IF (KC .LT. 2) GO TO 6cC  IF (SIGMIN(KP) .NE, SIGMAX(KP-1)) GO TO  IF (SIGMIN(KP) .NE, SIGMAX(KP-1)) GO TO  S95 KP = KP - 1  RNCYC(KP) = RNCYC(KP) + 1.5  633 GONTINUE		33 83 KP	۵						•
KC = 0 00 6GC I = 1,LMAX IF (NNSTEP(I) .NE, JJ) GC TO 500 KP = KP + 1 KC = KC + 1 NSTEP(KP) = KP SIGMAX (KP) = CYCLE(I,1) SIGMIN(KP) = CYCLE(I,2) RNCYC(KP) = RNCYC(I) IF (SIGMAX(KP) .NE, SIGMAX(KP-1)) GO TO IF (SIGMIN(KP) .NE, SIGMAX(KP-1)) GO TO F (SIGMIN(KP) .NE, SIGMAX(KP-1)) GO TO S95 KP = KP - 1 RNCYC(KP) = RNCYC(KP) + 1.5 633 GONTINUE	15	00	- 15						
00 6GC I = 1,LMAX  IF (NNSTEP(I) .NE. JJ) GC TO 500  KP = KP + 1  KC = KC + 1  NSTEP(KP) = KP  SIGMAX(KP) = CYCLE(I,1)  SIGMAX(KP) = CYCLE(I,2)  RNCYC(KP) = RNCYC(I)  IF (KC .LT 2) GO TO 6GC  IF (SIGMAX(KP) .NE. SIGMAX(KP-1)) GO TO  595 KP = KP - 1  RNCYC(KP) = RNCYC(KP) + 1.C  633 GONINUE		KC #							•
IF (NNSTEP(I) .NE. JJ) GG TO 500 KP = KP + 1 KC = KC + 1 NSTEP(KP) = KP SIGMAX(KP) = CYCLE(I,1) SIGMIN(KP) = CYCLE(I,2) RNCYC(KP) = RNCYC(I) IF (SIGMIN(KP) .NE. SIGMAX(KP-1)) GO TO S95 KP = KP - 1 RNCYC(KP) = RNCYC(KP) + 1.6 GJJ CONTINUE			I = 1, LMAX						
KP = KP + 1  KC = KC + 1  NSTEP(KP) = KP  SIGMAX(KP) = CYCLE(I,1)  SIGMIN(KP) = CYCLE(I,2)  RNCYC(KP) = RHCYC(I)  IF (KC - LT 2) G0 T0 G0  IF (SIGMAX(KP) .NE, SIGMAX(KP-1)) G0 T0  595 KP = KP - 1  RNCYC(KP) = RNCYC(KP) + 1.5  633 GONINUE			P(I) .NE.	009	:				
KG = KG + 1  NSTEP(KP) = KP  SIGMAX(KP) = CYCLE(I,1)  SIGMIN(KP) = CYCLE(I,2)  RNCYC(KP) = RNECYC(I)  IF (KC,LT, 2) GO TO GGC  IF (SIGMIN(KP) .NE, SIGMAX(KP-1)) GO TO  F (SIGMIN(KP) .NE, SIGMI(KP-1)) GO TO  S95 KP = KP - 1  RNCYC(KP) = RNCYC(KP) + 1.5  G00 TOUTINUE		# A							
SIGHAX (KP) = CYCLE(I,1) SIGHIN (KP) = CYCLE(I,2) RNCYC(KP) = RHECYC(I) I (KC .LT. 2) GO TO GGG IF (SIGHIN (KP) .NE. SIGHAX (KP-1)) GO TO 595 KP = KP - 1 RNCYC(KP) = RNCYC(KP) + 1.5 GJJ CONTINUE	97	1 k							
SIGNIN (KP) = CYCLE(1,1)  SIGNIN (KP) = CYCLE(1,2)  RNCYC(KP) = RHCYC(I)  IF (KC .LT. 2) GO TO 6GG  IF (SIGNIN (KP) .NE. SIGNIN (KP-1)) GO TO  595 KP = KP - 1  RNCYC(KP) = RNCYC(KP) + 1.C  633 CONTINUE		3702	F(KF) = KF						
STOCK(KP) = RHECYC(I)  IF (KC .LT. 2) GO TO 6GG  IF (SIGHAK(KP) .NE. SIGHAK(KP-1)) GO TO  595 KP = KP - 1  RNCYC(KP) = RNCYC(KP) + 1.C  633 CONTINUE		SIGN	AX(KP) = GYCLE(1)					•	:
IF (KC .LT. 2) GO TO 6GG IF (SIGHAK(KP) .NE. SIGHAK(KP-1)) GO TO IF (SIGHIN(KP) .NE. SIGHIN(KP-1)) GO TO 595 KP = KP - 1 RNCYC(KP) = RNCYC(KP) + 1.C 633 CONTINUE		RNCY	= RNECYC			1			
IF (SIGHAX(KP) .NE. SIGHAX(KP-1)) GO TO  1F (SIGHIN(KP) .NE. SIGHIN(KP-1)) GO TO  595 KP = 1  RNCYC(KP) = RNCYC(KP) + 1.C  633 CONTINUE	25	IF (	G0 T0						
595 KP = KP - 1 RNCYC(KP) = RNCYC(KP) + 1.0 633 CONTINUE		FI	В н	05 10					
699 CONTINUE		אסט אסט	• 7 ·	00					•
6aa CONTINUE		RNCY	= RNCYC(KP) +						
	30	6aa CONT							-  -

PROGRAM	RPCH	1 TRACE	CDC 6680 FT	COC 6680 FTN V3.3-320A OPT=G 11/20/72 15.44.26.	-0 11/20/	72 1	5.44.26.	PAGE
	609	605 CONTINUE KPMAX = KP						: .
	2313	WRITE(6,2010) FORMAT(1H1,48	MRITE(6,2010) FORMAT(141,48x,33HRANGE PAIR CYCLE COUNTED SPECTRUH//)	CTRUH//)				
35		WRITE(6,22) WRITE(6,25)	RITE(6,22) (RITE(6,25) (RSTEP(I),SIGMAX(I),SIGMIN(I),RNCYC(I),I = 1,KPMAX)	C(I),I = 1,KPM	(X			
		IF (NPUNCH .	IF (NPUNCH .EQ. 6) 60 TO 9999		:			-
	102	FORMAT (5X, 3F)	(Stempall) solicitation (1) y KNGTG(1), 1 = 110.2)	I, Treated				
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		END						

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	CONDITIONS									
ROUTINE DECIDE(X1,X2,X3,X4,KEY,I,CYCNO,KCYGEN) HHON/HDEC/SIGHAX(95.C),SIGHIY(930),NSTEP(903),LR,KMAX,KHIN,K31 HHON/HDECZ/RES(146.D),INDEX(1400),IND1,IND2,IND3,IND4,KIND HHON/HCYG/CYCLE(93G,2),RNECYC(930),NNSTEP(900)	OR NOT THE VALUES X1, X2, X3, AND X4 SATISFY THE RANGE PAIR COUNTING COND		60 10 506	•	60 TO 506					
SUBROUTING DECIDE(X1,X2,X3,X4,KEY COMMON/MDEC/SIGMAX(900),SIGMIN(90 COMMON/MDECR/RES(1460),INDEX(1400 COMMON/MCYG/CYCLE(906,2),RNECYC(9	THIS SUBROUTINE DECIDES WHETHER (FROM THE ADJUSTED LOAD SPECTRUM	KFIRST = 9 IF (K31 .NE. 3) GO TO 11 IF (X3 .LE. X2) GO TO 203 IF (X2 .GT. X1) GO TO 213	IF (XZ .LT. X4 .0R. X3 .GT. X1) IF (X2 .LT. X3) GG TO 151 IF (XCGEN(X3,X2,1.6,NSTEP(I)) GG TO 152 GALL CYCGEN(X2,X3, 1.0,NSTEP(I))	XI = X4 IF (IND3 • NE• IND2) LIND = 1 IND2 = IND4 KCYGEN = I FF (KEY • NE• U) GO TO 113	RETURN IF (X2 .GT. X4 .OR. X3 .LT. X1) GO TO 150 X1 = X1 X2 = X1	いいじことに	ADD X1 TO	KES(LK) = XI INDEX(LR) = IND1 X1 = X2 X2 = X3 X3 = X4	INDI = INDZ INDZ = INDZ IND3 = IND4 KCYGEN = 3 IF (KEY •NE. 0) GO TO 110	TE (CYCNO .6T. 1.0) 6G TO 1151  IF (CYCNO .6T. 1.0) 6G TO 1151  IF (CYCNO .EQ. 0.0) RETURY  CYCNO = CYCNO - 1.0  6G TO 1155
	300C	7 H	151 151	36 <b>→</b>	213		0 0 503			1110
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FF (TYD3 .NE, IND4) GO TO 1153  RNGCT(L) = RNCCT(L) + CYCNO - 2.0  VYCNO = 1.0  VYC	SUBROUTINE	DECIDE TRACE	CDC 6640 FTN V3.0-320A OPT=0	20 A OPT=0	11/20/72	15.44.26.	PAGE	
IF (CYCNO .NE. 0.0) GG TO 112  KHIN = 1  KHAX = 6  KCYCEN = 3  RETURN  126.0 IF (CYCNO .eEq. 0.6)  CYCNO = CYCNO - 1.0  X3 = SIGHAX(I)  X4 = SIGHAX(I)  X4 = SIGHIN(I)  IN X4		RNECYC(L) CYCNO = 1 IF (KMAX X3 = SIGI						
126.0 IF (CYCNO .EQ. 6.0)  CYCNO = CYCNO - 1.6  X4 = SIGMAX(I)  X4 = SIGMIX(I)  KFIRST = 1  GO TO 113  IN X4 = SIGMIX(I)  IF (KFIRST .NE. 0)  CYCNO = CYCNO - 1.0  KFIRST = 1  113 IND3 = NSIEP(I)  IND4 = IND3  KHIN = 1  KHAX = 0  CYCNO = CYCNO - 1.0  IND4 = SIGMAX(I)  IND4 = SIGMAX(I)  IND4 = SIGMAX(I)  IND4 = SIGMAX(I)  IND4 = SIGMIX(I)  KHAX = 1  KHAX = 1		N 4 3 H		3				
111 53 = SIGMAX(I)  X4 = SIGMAN(I)  X4 = SIGMAN(I)  IF (KFIRST = NE = 0)  CYCNO = CYCNO - 1.0  KFIRST = 1  113 IND3 = NSTEP(I)  IND4 = IND3  KMAN = 1  KMAN = SIGMIN(I)  IND4 = NSTEP(I)  KMAN = 1		IF (CYCNO .EQ. G.G)  CYCNO = CYCNO - 1.0  X3 = SIGHAX(I)  X4 = SIGHIN(I)  KFIRSI = I						
113 IND3 = NSTEP(I)	· 10	GO TO 113 X3 = SIGMAX(I) X4 = SIGHIN(I) IF (KFIRST NE: 0) GYCNO = GYCNO - 1:1						:
1500 IF (KMAX *NE* 0) GO IF (CYCNO = CYCNO - 1.0 112 X4 = SIGMAX (I) 112 X4 = SIGMAX (I) 110 X4 = SIGMAX (I) 1510 X1 = C GO TO 11 1510 X4 = SIGMIN(I) 1104 = NSTEP(I) KMAX = C KMIN = I KMIN = I KMIN = I GO TO 10 END		IND = NSTEP(I) IND = IND 3 KHIN = 1 KHAX = 0 GO TO 10			:	:		
60 TO 1 1510 X4 = SI 1510 X4 = SI 1NB4 = KHAX = KHIN = 60 TO 1		IF (KHAX .NE. 0) GO 1 IF (CYCNO .EQ. 0.0) F CYCNO = CYCNO - 1.0 CYCNO = SIGMAX (I) INDH = NSTEP(I) KHAX = 1			•			
		KAIN = X4 SI IND4 SI KHAX = KH	÷	; ;		:		i .
	S	60 TO 10 END					:	

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RES TRACE	SUBROUTING DECRES(LRMAX,NCYNO) COMMON/MCGDE/L,LIND GOMMON/MDECRARS(14,1),TNDFX(14,00),TND1,TND2,TND3,TND1,KIND
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rv.	ပ ပ	THIS SUBROUTINE DECIDES WHETHER OR NOT THE ELEMENTS OF THE RESIDUE SPECTRUM SATISFY THE RANGE PATH COUNTING CONDITIONS	LEMENTS OF THE RESIDUE	
:	O			
		0 " "	•	
		NCYNO = 0		
10		X1 = RES(1)		
		X2 = RES(2)		
		X3 = RES(3)		
		X4 = RES(4)		
		IND1 = INDEX(1)		
15		IND2 = INDEX(2)		
		IND3 = INDEX (3)		
		IND4 = INDEX(4)		•
	1.0	IF (X2 .67. X1) GO TO 136		i
20		. LT. X4 .		
	153	IF (X2 .GT. X3) GO TO 151		
		CALL CYCRES(X3,X2,1.i,IND3)		
		G0 T0 152		
	151	_		
25	152			
		X2 = X4		
		INDS = IND4		
		7		
36		IF ((J + 1) .EQ. LRMAX) GO TO 315		
		X4 = RES(J+2)		
		IND3 = INDEX(J+1)		
		IND4 = INDEX(J+2)	•	
35		J = J+2		
		GO TO 10		
	1.00	IF (X2 .GT. X4 .OR. X3 .LT. X1) GO TO 500		1
		60 10 150	•	
	533	X = X + 1		
0 4		RES(K) = X1		
		INDEX(K) = IND1		
	,	++		
		IF (J .GT. LRMAX) GO TO 336		
		X1 = X2		
45		X2 = X3		

SUBROUTINE DECRES TRACE

INDEX(K) = INDI INDEX(K+1) = IND2 LRHAX = K + 1 DETION	T X #	RES(K+2) = RES(J+1) INDEX(K) = IND1 INDEX(K+1) = IND2 INDEX(K+2) = INDEX(J+1)	, TX = 1	RES(K+Z) = X4 INDEX(K) = IND2 INDEX(K+Z) = IND3 INDEX(K+Z) = IND4 LRMAX = K + 2 RETURN	CZU
	99	65	7.6	15	

PAGE

SUBROUTINE CYCRES(Y1,Y2, CYC.)F,NSTEPP) COMMON/MCYG/CYCLE(900,2),RNECYC(900),RNSTEP(900) COMMON/MCGDE/L,LIND THIS SUBROUTINE GENERATES CYCLES FOR THE ANALYSIS SPECTRUP FROM DATA Supplied by subroutine decres

L = L + 1 GYCLE(L,1) = Y1 GYCLE(L,2) = Y2 RNECYG(L) = CYGPF NNSTEP(L) = NSTEPP RETURN ENO

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